Overview

Ischemic stroke causes a rapid loss of brain function and subsequent brain damage as a result of the interruption of blood flow due to thrombosis or embolism. Stroke accounts for 1 out of every 20 deaths and $34 billion in economic costs each year in the United States. The only drug approved by the FDA for treatment of ischemic stroke is tissue plasminogen activator (tPA), which lyses the blood clot and reperfuses the occluded artery. However, tPA can only be administered during a very narrow window of time, and may cause cerebral hemorrhage.

This invention is an adjuvant to tPA therapy that is capable of increasing the efficacy and potency of tPA-mediated thrombolysis, while decreasing the risk of side effects. The adjuvant acts within the blood clot itself, providing a more optimal environment for the tPA mechanism of action. The result is more specific tPA-to-clot binding and less aberrant activity on the vessel wall, decreasing the risk for a potentially lethal cerebral hemorrhage.

Commercial Application

tPA can only be administered within 3 hours of the first symptoms occurring, and as a result, many stroke patients are not able to get to the hospital in time to receive treatment. Because studies have associated better clinical outcomes with patients that receive tPA therapy, including a lower risk for developing a disability or needing long-term care, an adjuvant that is able to expand the time window for tPA administration would be highly valuable to healthcare professionals that treat stroke patients.

This technology, which significantly decreases the risk of tPA-mediated cerebral hemorrhage, is capable of expanding the therapeutic window for tPA to at least 6 hours.
Benefits

- **tPA can be administered in lower doses.** More specific binding of tPA to the clot as a result of the adjuvant mechanism of action means that less tPA is needed to achieve optimal therapeutic outcomes.
- **Improved safety profile for tPA.** By increasing the binding of tPA to the clot and administering a lower dose, the likelihood of a tPA-mediated cerebral hemorrhage is decreased. This may open the door for the use of tPA-adjuvant therapy for myocardial infarction, vein thrombosis, and pulmonary embolism.
- **Expanded therapeutic window for administration of tPA.** About 87% of strokes that occur are ischemic strokes\(^1\); however, most patients do not make it to the hospital within 3 hours. This invention makes it possible for a larger percentage of ischemic stroke patients to receive tPA therapy as a result of the increased therapeutic window.

About the Inventor

Dr. Yang V. Li is a Professor of Neurosciences in the Biomedical Sciences department at Ohio University. His research is largely funded by NIH to understand the cell-to-cell communication in the brain and to investigate the cell & molecular signaling of cell death or survival.

References


Contact Us

Korie G. Counts, Ph.D.
Technology Commercialization Manager
P: 740-593-0977
E: [counts@ohio.edu](mailto:counts@ohio.edu)
[http://www.tto.ohiou.edu](http://www.tto.ohiou.edu/)

Ohio University